

REMARKS

Applicant respectfully requests reconsideration of this application. Claims 1-26 are pending. Claims 1, 11, and 22 have been amended. No claims have been cancelled or added.

Therefore, claims 1-26 are now presented for examination.

Claim Rejection under 35 U.S.C. §102

Calamvokis, et al.

The Examiner rejected claim 1-7, 11-13, 16-18, and 20-26 under 35 USC §102(e) as being anticipated by U.S. Patent 6,856,622 of Calamvokis, et al. (hereinafter referred to as “*Calamvokis*”).

Claim 1, as amended herein, reads as follows:

1. A method for multicasting a data cell received in a switch structure, comprising:

- registering an address and priority corresponding to said data cell at an ingress port in a memory cell, the memory cell being addressable by the priority;

- controlling a flow of said data cell;

- asserting a multicast service request for said data cell using the memory cell;

- in response to said asserting, granting said multicast service request;

- arranging a multicast fan-out for said data cell; and

- in response to said arranging, configuring said switch structure.

Claim 1 thus regards multicasting a data cell received in a switch. In such method, an address and priority corresponding to the data cell are registered at an ingress port in a memory cell, where the memory cell is addressable by the priority. Further, a

multicast service request for said data cell is asserted using the memory cell. It is submitted that, among other differences, *Calamvokis* does not contain these elements of Claim 1.

Calamvokis relates to scheduling of multicast data cells, specifically regarding a method of facilitating the scheduling of a first multicast request signal of a series of multicast request signals. However, the *Calamvokis* provides a different type of system, one that would be memory intensive and would not be appropriate in, for example, a single chip design. As the problem to be addressed is described in *Calamvokis*:

First, multicast cells from one ingress linecard and of the same priority with a request label of particular identifying characteristic (i.e., the cells are said to be "in the same flow") typically share a queue with cells having differing labels, and can thus suffer from head-of-line blocking. Cells destined for a first set of outputs (as indicated by a "fanout" roster of outputs) can potentially block other cells destined for a second and differing set of outputs, even if the blocked cells' outputs are currently free. Second, cells with large fanouts may be substantially delayed before their destination outputs become free. While it is desirable to use the crossbar to copy cells, requiring that all such copies be delivered to their egress switch ports in the same time slot leads to unnecessary additional head-of-line blocking.

(*Calamvokis*, col. 2, lines 12-26) Thus, *Calamvokis* is concerned with multicast cells of a particular type (having a particular label) sharing a queue with cells of a different label, thus potentially resulting in head of line blocking even if the blocked cells' outputs are currently free.

The operation of a system in *Calamvokis* to address this problem may be seen in, for example, Figure 1 of *Calamvokis*, in which an ingress linecard 108A is interfaced

with an ingress port 102A of a switch core 100. This is further illustrated in Figure 2 of *Calamvokis*, which illustrates linecard 108A as including multiple output queues, with one queue being provided per priority. Thus, in contrast to the process described in Claim 1 of the current application, *Calamvokis* is suggesting the continued use of numerous queues to separate priorities. As indicated, it is assumed for Figure 2 that ingress linecard 108A holds a multicast cell to send to egress linecards 108B at priority 0. (*Calamvokis*, col. 4, lines 39-41) In this process, there is a check to determine whether the linecard has sufficient multicast queue credits to send a request to the core, and when the credits are available, an LCS request is made indicating that linecard 108A is sending a priority 0 multicast cell. (*Calamvokis*, col. 4, lines 44-49) Continuing:

(B) When ingress switch port 102A receives the LCS Request, it adds the request to a multicast FIFO for priority 0. Switch port 102A sends a request to scheduler subsystem 106 indicating that linecard 108A is to send a priority 0 multicast cell with label M.

(*Calamvokis*, col. 4, lines 50-54) Thus, the system does provide for the specific transmission of a cell with a particular label (M) out of a queue, but the queue is of a particular priority. There is a multicast FIFO for each priority, thus requiring numerous queues for cells to be transferred. There is no indication the priority is stored in memory cells for the data cells, or that the memory cells are addressable by priority. Rather, the cells are directed by priority to the relevant queue.

With regard to priority, as is further described in *Calamvokis*, the scheduler subsystem provided may include multiple separate priority planes, with each priority plane described as containing an array of scheduler chips:

As illustrated in FIG. 4 and discussed above, scheduler subsystem 106 comprises up to four separate priority planes 118. Scheduler subsystem 106 may, alternatively, comprise more than four priority planes as requirements demand. Each priority plane 118 contains an array 121 of scheduler chips (X-SCH) 120 that together form a single-priority scheduler. Each priority plane 118 further comprises a set of fanout roster storage chips (X-FIT) 122 that store a multicast fanout table (not shown) and, by referring to this fanout table, select multicast fanouts based on multicast labels associated with LCS requests. FIG. 4 further illustrates the arrangement of X-SCH and X-FIT chips 122 needed to build a four priority 256x256 scheduler with a fifth redundant plane.

(*Calamvokis*, col. 7, lines 6-19) There is no suggestion in this discussion regarding the recordation of priority in memory cells, as is provided in Claim 1 of the present application.

Further, *Calamvokis* does not provide for the assertion a multicast service request for said data cell using the memory cell, as provided in Claim 1 of the present application. As shown above, *Calamvokis* does not describe such memory cells. As further shown above, the system in *Calamvokis* provides for an ingress switch port receiving a request from a linecard, with the ingress switch port adding the request to a multicast FIFO for the appropriate priority. The switch port sends a request to a scheduler subsystem, and the scheduler subsystem determines a configuration for the crossbar switch, and sends a grant to switch port indicating when the data cell is needed.

(*Calamvokis*, col. 4, lines 44-65) There does not appear to be any suggestion in *Calamvokis* of the element of claim 1 regarding the assertion of a multicast service request for the data cell using the memory cell.

For at least the reasons described above, *Calamvokis* does not anticipate Claim 1. It is submitted that the same arguments apply to independent claims 11 and 22 which contain analogous claim elements. The remaining rejected claims are dependent claims, and, while having other differences with the cited reference, are allowable as being dependent on the allowable base claims.

Claim Rejection under 35 U.S.C. §103

Calamvokis, et al. in view of Hughes, et al.

The Examiner rejected claims 8, 9, and 19 under 35 USC §103(a) as being unpatentable over *Calamvokis* in view of U.S. Patent Application 6,747,971 of Hughes, et al. (hereinafter referred to as “*Hughes*”).

In addition to having other differences from the cited references, claims 8, 9, and 19 are allowable as being dependent on the allowable base claims, claims 1 and 11

Hughes describes a crosspoint switch with independent schedulers. It is submitted that *Hughes* does not teach or reasonably suggest the claims elements shown to be missing from *Calamvokis*. It appears that the discussion of priority is directed towards a pointer system to determine priority between multicast and unicast traffic, or between competing input control ports. Thus, the cited references, together or separately, do not teach or reasonably suggest the elements of the claims.

Claim Rejection under 35 U.S.C. §103

Calamvokis, et al. in view of Beshai, et al.

The Examiner rejected claim 10 under 35 USC §103(a) as being unpatentable over *Calamvokis* in view of U.S. Patent Application 7,000,026 of Beshai, et al. (hereinafter referred to as “*Beshai*”).

In addition to having other differences from the cited references, claim 10 is allowable as being dependent on the allowable base claim, claim 1.

Beshai regards transferring data segments of a data stream across multi-channels links in a high-capacity network, and does not appear to have any relevance to the claim elements shown to be missing from *Calamvokis*. Thus, the cited references, together or separately, do not teach or reasonably suggest the elements of the claims.

Claim Rejection under 35 U.S.C. §103

Calamvokis, et al. in view of Luijten, et al.

The Examiner rejected claims 14 and 15 under 35 USC §103(a) as being unpatentable over *Calamvokis* in view of U.S. Patent 6,324,164 of Luijten, et al. (hereinafter referred to as “*Luijten*”).

(Note: The Office Action cites to U.S. Patent 7,000,026, but this appears to be a typographical error as this is the *Beshai* patent. Applicant is providing this response based on the patent cited in the Notice of References Cited.)

In addition to having other differences from the cited references, claims 14 and 15 are allowable as being dependent on the allowable base claim, claim 11.

Luijten regards an asynchronous transfer mode (ATM.) protocol adapter for a high speed cell switching system, and does not appear to have any relevance to the claim elements shown to be missing from *Calamvokis*. Thus, the cited references, together or separately, do not teach or reasonably suggest the elements of the claims.

Conclusion

Applicant respectfully submits that the rejections have been overcome by the amendment and remark, and that the claims as amended are now in condition for

allowance. Accordingly, Applicant respectfully requests the rejections be withdrawn and the claims as amended be allowed.

Invitation for a Telephone Interview

The Examiner is requested to call the undersigned at (503) 439-8778 if there remains any issue with allowance of the case.

Request for an Extension of Time

The Applicant respectfully petitions for an extension of time to respond to the outstanding Office Action pursuant to 37 C.F.R. § 1.136(a) should one be necessary. Please charge the fee for such extension to our Deposit Account No. 02-2666.

Charge our Deposit Account

Please charge any shortage to our Deposit Account No. 02-2666.

Respectfully submitted,

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Date: September 14, 2007 /Mark C. Van Ness/
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